Chapter 6:

Dam Safety

2002 Edition

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Introduction

New Hampshire is blessed with an abundance of high-quality rivers and streams. New Hampshire is also the fastest growing state in the northeastern United States, which creates keen competition for use of those flowing waters for flood control, recreation, irrigation, hydropower, fisheries, *etc*. Failure to adequately address these competing interests could create long-term difficulties for both the state's economy and its natural environment. DES, through its Dam Bureau, regulates the repair, reconstruction, maintenance, and operation of existing dams, and reviews design plans and issues decisions for the construction, operation, and maintenance of new dams. The DES Dam Bureau also is responsible for regulating the retention or release of stored water to support a variety of uses (*e.g.*, hydropower generation, autumn lake drawdowns to make room for spring runoff, flood flow management and mitigation, fisheries and water quality protection) for both public and private purposes, which may often be in direct conflict with one another.

"Balancing" Multiple Uses of Water

Access to New Hampshire's surface waters is controlled by the common law doctrine of "reasonable use". Those who live near rivers and streams use the water in concert with their *riparian* rights, while those who live near the state's lakes and ponds use it in accordance with their *littoral* rights. The DES Dam Bureau attempts to ensure that the multiple interests in using surface waters for boating, fishing, power generation, wastewater assimilation, aesthetics, irrigation, and water supply do not exhaust the availability of the resource, or create an imbalance in favor of one use over the others. By reviewing applications for constructing and reconstructing dams in New Hampshire, the DES Dam Bureau serves a pivotal role in balancing the interests of all parties between preservation/protection of the natural resource and stimulation/sustenance of New Hampshire's vibrant economy.

Legal Authority

DES Dam Bureau activities are governed by RSA 482 ("Dams, Mills, and Flowage", http://gencourt.state.nh.us/rsa/html/indexes/482.html and NH CODE ADMIN. RULES Env-Wr 100-800 ("Dam Safety Rules", http://www.des.state.nh.us/dam/env-wr100-800.html). Most of the bureau's actions also are affected by RSA 482-A ("Fill and Dredge in Wetlands", http://gencourt.state.nh.us/rsa/html/indexes/482-A.html) and NH CODE ADMIN. RULES Wt 100-700 ("Wetlands Bureau Code of Administrative Rules", http://www.des.state.nh.us/wetlands/pdf/wt100-700.pdf). The U. S. Army Corps of Engineers (see http://www.nae.usace.army.mil/) is involved with DES Dam Bureau decisions relative to permitting hydropower dams, removing existing dams, and coordinates with the DES Dam Bureau when writing "individual permits" for discharges to surface waters of the United States under Section 404 of the federal Clean Water Act (see http://www.epa.gov/r5water/pdf/ecwa_t4.pdf) or the federal River and Harbor Act of 1899, as amended (see http://www4.law.cornell.edu/uscode/33/ch12.html) for projects that may affect navigation in federal channels. The Army Corps also coordinates its activities through its partnership with the DES Wetlands Bureau in the State Programmatic General Permit ("SPGP") process (see http://www.des.state.nh.us/wetlands/nhspgp.htm).

Definition of a Dam

Jurisdictional dams in New Hampshire are defined by RSA 482:2, II ("Dams, Mills, and Flowage/Definitions", http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm) as *any artificial barrier, including appurtenant works, which impounds or diverts water, and which has a height of 4 feet or more, or a storage capacity of 2 acre-feet or more, or is located at the outlet of a great pond. A roadway culvert shall not be considered a dam if its invert is at the natural bed of the water course, it has adequate discharge capacity, and it does not impound water under normal circumstances. Artificial barriers which create surface impoundments for liquid industrial or liquid commercial wastes or municipal sewage, regardless of height or storage capacity, shall be considered dams*

(see http://www.des.state.nh.us/dam/damburweb.pdf). A number of different types of dams are common to New Hampshire, and are divided into two main categories: embankment dams and gravity dams (see http://www.des.state.nh.us/factsheets/dam/db-2.htm). Examples of embankment dams include an earth fill dam, a zone embankment dam (used in most modern dams), and timber crib dam. Examples of gravity dams include a concrete dam, a masonry dam, and a rubble dam.

Dams are assigned to one of four classes based on their potential for damage to property or threat to public safety if they were to fail (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Class AA dams are those dams that would pose no real danger to life or property were they to fail, such as a small storm water retention pond dam in a residential subdivision. They comprise about 74 percent of all dams in New Hampshire, and are inspected by DES dam safety engineers in response to a request from the public, or on an as-needed basis in light of structural deterioration or a change in the development of the downstream area. Class A dams are considered to pose a low hazard potential in the event of failure, such as a low- to medium-sized dam on a major water course within a large floodplain area. They comprise about 17 percent of all dams registered in the State Dam Inventory and are inspected every six years or at the request of the dam owner or the public. Class B dams represent a significant hazard potential should they fail. They comprise about six percent of all registered dams in the state, and are inspected by DES every four years. An example of a Class B dam would be one that impounds the drinking water supply for a community. Dams that pose a high hazard potential because of size and location are designated as Class C dams, and represent only three percent of all dams registered; they are inspected every two years. Failure of a Class C dam would pose a substantial threat of extensive damage to property and highways, with probable loss of life. Once issued, the permit for a dam in any class is recorded by the DES Dam Bureau in the appropriate county Registry of Deeds so as to run with the land. A hydropower dam, designed and constructed to provide mechanical or electrical power, may be classed in any hazard category. The U. S. Department of Energy's Federal Energy Regulatory Commission ("FERC") plays a significant role in the decision-making process for hydropower dams (see http://www.ferc.fed.us/hydro/hydro2.htm)

Emergency Action Plans

In 1983, the New Hampshire Legislature amended RSA 482 at 482:2, VI and RSA 482:12 (see http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm and http://gencourt.state.nh.us/rsa/html/L/482/482-12.htm) to require dam owners to prepare a contingency plan in the event of a dam failure. These plans are called *Emergency Action Plans* ("EAPs") and are required for all dams in the state that pose a menace to public safety if they were to fail; particularly those with a significant (Class B dam) or high (Class C dam) hazard potential. All EAPs must address the monitoring, evaluation, preventive action, and warning aspects of managing a dam failure, including delineation of the inundation zone. The approved EAP must be kept on file with the response agencies of the local community, local Emergency Management Director, the State Police and Emergency Management Divisions of the New Hampshire Department of Safety, and DES. The dam owner is required to work with the local community(ies) to develop an effective EAP and must periodically review and update the EAP. Annual testing of the emergency communications network also is required. Dam owners are responsible for training the operations personnel who must be prepared to act promptly and efficiently if a dam begins to show signs of failure. Early identification of hazardous conditions at the dam will prompt the implementation of emergency procedures outlined in the approved EAP. It is important for the dam owner or operator to be familiar with operating the structure under both normal and emergency conditions and to be capable of recognizing specific types of failure modes such as over-topping and piping.

Dam Removal Process

DES has created a dam removal process that combines the dam safety program with the wetlands program to identify, evaluate, and (when warranted) remove unwanted or unneeded dams along New Hampshire's rivers and streams (see http://www.des.state.nh.us/factsheets/dam/db-18.htm). The reasons for removal of dams range from relieving the owner of liability for a dam in disrepair that poses a threat to public safety (see http://www.des.state.nh.us/factsheets/dam/db-10.htm) to restoration of anadromous fish

migrations. The DES evaluative process examines a dam's current benefits and contrasts those with anticipated losses upon removal. Benefits may be environmental, social, economic, or cultural in nature. Losses may include the draining (*i.e.*, promotion of groundwater discharge) of wetlands or wells near the river's edge, loss of irrigation sources or real estate value, and flood control. The dam removal process is a collaborative effort between the dam owner, the local community, DES, and others parties with riparian interests.

Summary

The Dam Bureau within the DES Water Division is charged with the primary administration of the dam safety program (see http://www.des.state.nh.us/dam/). Appeals of permit decisions or orders issued for violations of program requirements should be directed to the Water Council (see http://www.des.state.nh.us/councils/#1).

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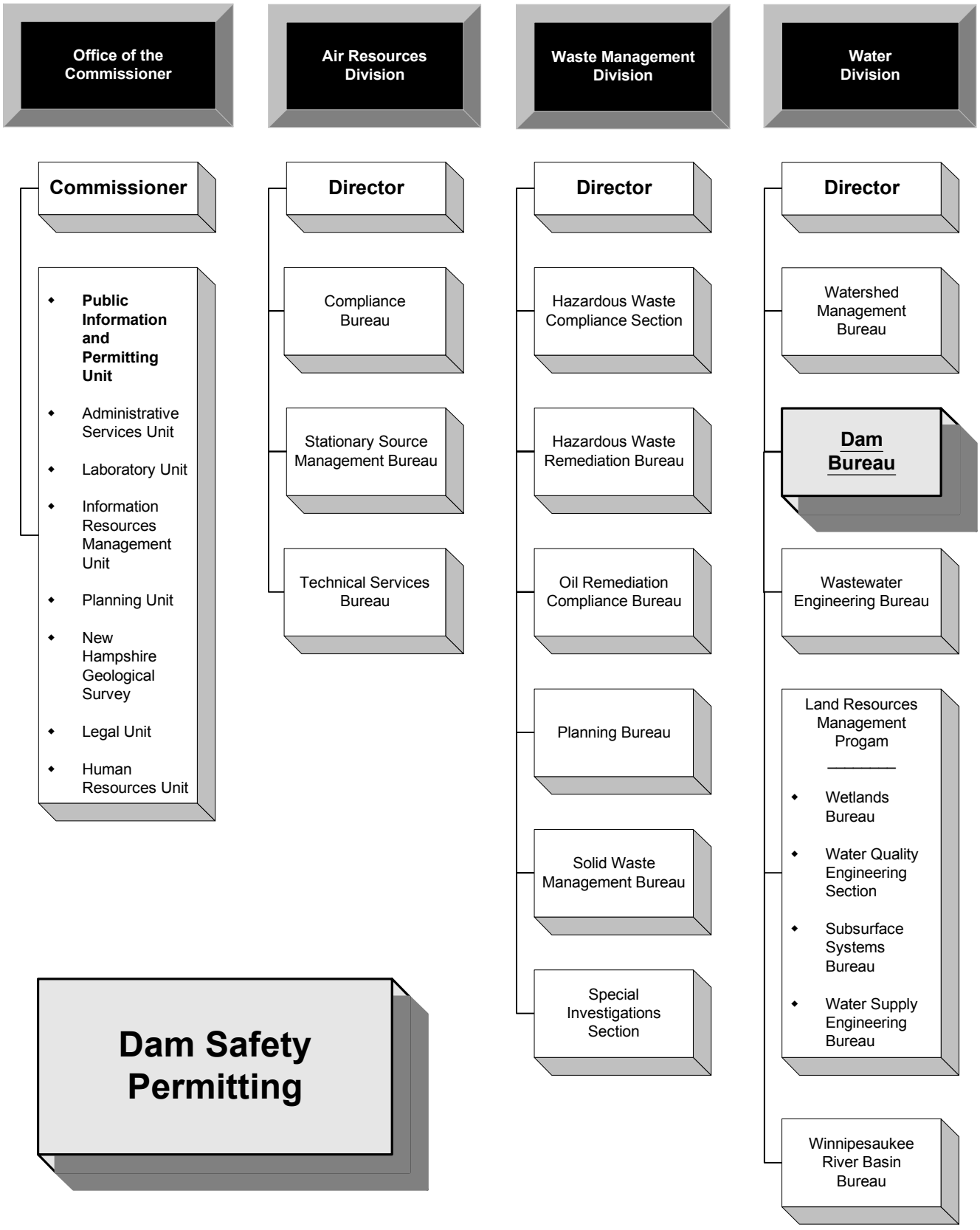
Organizational Chart

New Hampshire Department of Environmental Services



Class AA Dam Permit (Non-Hazard Potential)

Introduction: There is a statewide need to conserve and control surface water flowage to accommodate multiple (and sometime conflicting) uses of our water resources, while still protecting public health and safety. Such uses include fire ponds, flood control, hydropower, irrigation and recreation. A "dam" is defined by RSA 482:2, II ("Dams, Mills, and Flowage/Definitions", http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm) as *any artificial barrier, including appurtenant works, which impounds or diverts water, and which has a height of 4 feet or more, or a storage capacity of 2 acre-feet or more, or is located at the outlet of a great pond. A roadway culvert shall not be considered a dam if its invert is at the natural bed of the water course, it has adequate discharge capacity, and it does not impound water under normal circumstances. Artificial barriers which create surface impoundments for liquid industrial or liquid commercial wastes or municipal sewage, regardless of height or storage capacity, shall be considered dams* (see http://www.des.state.nh.us/dam/damburweb.pdf). Under certain circumstances a road culvert can also be defined as a dam (see NH CODE ADMIN. RULE Env-Wr 301.01, http://www.des.state.nh.us/dam/env-wr100-800.html). DES's Dam Bureau regulates the construction of new dams and the reconstruction of existing dams. For purposes of permitting, "reconstruction" is defined as changing the height, length, or discharge capacity of the structure; restoring a breached dam or one in ruins; modifying flashboards to either increase their height or increase the headwater elevation at which the boards will fail; or changing the structural configuration of a dam (see http://www.des.state.nh.us/factsheets/dam/db-3.htm). After receiving an application, a site visit will be conducted by a DES Dam Bureau engineer/inspector to assign a hazard classification and a State Dam Inventory number. Notice also will be provided to the municipality in which the dam is located. Any dams to be constructed on Great Ponds must first be approved by the State Legislature. Applicants for dams to be constructed on the Connecticut River must also apply for a certification and permit from the Commissioner of the New Hampshire Department of Transportation pursuant to RSA 1:8-10 ("State Boundaries", http://gencourt.state.nh.us/rsa/html/I/1/1-8.htm). Any previously unregistered dam must be registered with DES, including notice to the municipality, and must be classified in its proper hazard category (see http://www.des.state.nh.us/dam/exist_damapp.pdf). Of New Hampshire's active dams, 74 percent are registered as "Class AA", or non-hazard, dams (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). A Class AA dam is one which, if it were to fail, would not threaten human life or property and also meets the following criteria: (a) is not greater than six feet high with a storage capacity greater than 50 acre-feet or (b) is not greater than 25 feet high with a storage capacity greater than 15 acre-feet (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Class AA dams will be inspected at the public's request or on an as-needed basis in light of structural deterioration or a change in the development of the downstream area. If the potential exists for increased personal injury or property damage, a Class AA dam may be reclassified to reflect the change in hazard potential. Class AA Dam Permits are recorded by the DES Dam Bureau at the appropriate county Registry of Deeds so as to run with the land and then are forwarded to the dam owner.

Average number of permits issued annually: 30

Fees: $250 application fee. (Class AA dams are not subject to an annual dam registration fee to support the State Dam Inspection Program.)

Estimate processing time after application is deemed "complete": 2-3 weeks

Permit duration: 2 years to complete construction

Permit transferability: Current dam owner is required to notify DES if property is sold. Notification must include new owner's name and address.

Permit modification: Current dam owner is required to submit a written request to DES describing any changes to the project as originally designed. Upon review of additional plans and specifications, DES may require that the permit be modified.

Permit renewal: If dam construction has not been completed within two years, the owner is required to submit a written request for a 2-year permit extension, which must be received prior to the expiration of the original permit or a new application will be required.

State statute: RSA 482 ("Dams, Mills, and Flowage", http://gencourt.state.nh.us/rsa/html/indexes/482.html)

N. H. Code of Administrative Rules: Env-Wr 100-800 ("Dam Safety Rules", http://www.des.state.nh.us/dam/env-wr100-800.html)

Appeals body: Water Council at RSA 21-O:7 ("Department of Environmental Services/Water Council", http://gencourt.state.nh.us/rsa/html/I/21-O/21-O-7.htm; see also http://www.des.state.nh.us/rules/env-wc200.pdf and http://www.des.state.nh.us/councils/#1)

Additional information: N. H. DES, Dam Bureau, (603) 271-3406
N. H. DES, Wetlands Bureau, (603) 271-2147
N. H. DES, Public Information Center, (603) 271-2975 or (603) 271-8876

Class AA Dam Permit (Non-Hazard Potential) – *Work Sheet*

Key Qualifier Question: *Will the proposed dam be constructed (or reconstructed) to qualify as a Class AA dam which, if it were to fail, would not threaten life or property and (a) is not greater than 6 feet high with a storage capacity greater than 50 acre-feet or (b) is not greater than 25 feet high with a storage capacity greater than 15 acre-feet?*

What must you do to apply?

- Obtain a copy of the *Application to Construct or Reconstruct a Dam* from the DES Dam Bureau, DES Public Information Center, or online at http://www.des.state.nh.us/dam/damapp.pdf.
- Review the DES Fact Sheets entitled *Basic Nomenclature of a Dam* http://www.des.state.nh.us/factsheets/dam/db-1.htm and *Dam Construction and Reconstruction – How to Proceed* at http://www.des.state.nh.us/factsheets/dam/db-3.htm.
- Provide the name, address, and telephone number of the applicant.
- Define the height and length of the dam.
- Locate the dam on a U. S. Geological Survey map to clearly identify the dam's location (see http://www.topozone.com). This location map should be drawn in sufficient detail to enable a DES inspector to locate the proposed construction site.
- Provide the municipal tax map number and lot number for the property upon which the dam will sit.
- Calculate the drainage area, pond area, and storage capacity of the dam.
- Define the type and describe the purpose of the dam.
- Describe and specify the type of foundation material to be used for the dam.
- Provide the design storm frequency and inflow, and the dam's discharge capacity.
- Prepare a brief description of downstream structures that could be impacted by the dam's failure.
- Identify the name of the stream, river, or water body to be affected.
- Submit a plan and cross section of the proposed dam through the outlet.
- If this project is for reconstructing an existing dam, provide a description of the proposed reconstruction.
- Submit a written operational procedure plan and a construction inspection plan.
- Submit the results of subsurface explorations.
- Submit the results of hydrologic and hydraulic calculations.
- Submit calculations that demonstrate the dam has sufficient discharge capacity to pass the 50-year, 24-hour precipitation storm with one foot of freeboard without manual operations.
- Incorporate a pond drain (although a pond drain is not required, it is recommended).
- Submit construction plans and specifications that comply with NH CODE ADMIN. RULES Env-Wr 100-800 (see http://www.des.state.nh.us/dam/env-wr100-800.html).
- Submit gradation specifications of embankment materials.
- Submit a statement which demonstrates that the applicant has flowage rights on all lands which will be temporarily or permanently flooded.
- Show 2.5:1 side slopes as a minimum on any earth portion of the dam (3:1 side slopes are preferred) with a minimum top width of 6 feet. (Although this is recommended, it is not required.)
- Submit the application, a check for $250 made payable to the "Treasurer, State of New Hampshire", and all supporting materials to: Dam Bureau, Water Division, New Hampshire Department of Environmental Services, 6 Hazen Drive, P. O. Box 95, Concord, NH 03302-0095. Telephone: (603) 271-3406; fax: (603) 271-7894; or online: http://www.des.state.nh.us/dam/
- The site's hazard potential will be evaluated by DES Dam Bureau staff relative to such factors as the presence of downstream structures, roadways, and topography. The hazard class of a dam is based on the potential for adverse consequences to human life and property caused by a dam failure. The DES Dam Bureau will assess all impacts of dam failure when assigning a hazard classification (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). If the assessment confirms the Class AA designation, no further fees will be required.

What types of projects require this permit?

- Small farm ponds
- Storm water retentions ponds for subdivisions
- Remote dams with little or no downstream development

If there are questions regarding this page or any other section of the Guidebook, please contact Tim Drew, Administrator, Public Information and Permitting Unit, at tdrew@des.state.nh.us or at (603) 271-3306.

Class A Dam Permit (Low Hazard Potential)

Introduction: There is a statewide need to conserve and control surface water flowage to accommodate multiple (and sometime conflicting) uses of our water resources, while still protecting public health and safety. Such uses include fire ponds, flood control, hydropower, irrigation and recreation. A "dam" is defined by RSA 482:2, II ("Dams, Mills, and Flowage/Definitions", http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm) as *any artificial barrier, including appurtenant works, which impounds or diverts water, and which has a height of 4 feet or more, or a storage capacity of 2 acre-feet or more, or is located at the outlet of a great pond. A roadway culvert shall not be considered a dam if its invert is at the natural bed of the water course, it has adequate discharge capacity, and it does not impound water under normal circumstances. Artificial barriers which create surface impoundments for liquid industrial or liquid commercial wastes or municipal sewage, regardless of height or storage capacity, shall be considered dams. any artificial barrier that impounds or diverts water and either measures at least four feet high on the downstream face, or stores two acre-feet of water, or both* (see http://www.des.state.nh.us/dam/damburweb.pdf). Under certain circumstances a road culvert can also be defined as a dam (see NH CODE ADMIN. RULE Env-Wr 301.01, http://www.des.state.nh.us/dam/env-wr100-800.html). DES's Dam Bureau regulates the construction of new dams and the reconstruction of existing dams. For purposes of permitting, "reconstruction" is defined as changing the height, length, or discharge capacity of the structure; restoring a breached dam or one in ruins; modifying flashboards to either increase their height or increase the headwater elevation at which the boards will fail; or changing the structural configuration of a dam (see http://www.des.state.nh.us/factsheets/dam/db-3.htm). Subsequent to the receipt of each application, a site visit will be conducted by a DES Dam Bureau engineer/inspector to assign a hazard classification and a State Dam Inventory number. DES also will provide notice of this determination to the municipality in which the dam is located. Any previously unregistered dam must be registered with DES, including notice to the municipality, and must be classified in its proper hazard category (see http://www.des.state.nh.us/dam/exist_damapp.pdf). Any dams to be constructed on Great Ponds must first be approved by the State Legislature. In addition, if a dock, dam, building, or other structure is to be constructed in or adjacent to the bank or bed of any of the rivers that form New Hampshire's boundary (particularly the Connecticut River), the project applicant must also apply to the Commissioner of the New Hampshire Department of Transportation pursuant to RSA 1:8-10 ("State Boundaries", http://gencourt.state.nh.us/rsa/html/I/1/1-8.htm) for certification and a permit for the boundary work. Of New Hampshire's active dams, 17 percent are registered as "Class A" in the low hazard category (see http://www.des.state.nh.us/factsheets/dam/db-14.htm). A Class A dam is one which, if it were to fail, would result in any of the following: no possible loss of life, minimal economic loss, major damage to town and city roads, minor damage to Class I or II state highways, or the release of liquid industrial, agricultural, or commercial wastes or municipal sewage if the storage capacity is less than two acre-feet and is located more than 300 feet from a water body or water course (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Class A dams will be inspected every six years or at the request of the dam owner or the public, with an eye toward structural deterioration or a change in the development downstream. If a change in the potential for personal injury or property damage occurs, a Class A dam may be reclassified to reflect the change in hazard potential. Class A Dam Permits are recorded by the DES Dam Bureau at the appropriate county Registry of Deeds so as to run with the land and then are forwarded to the dam owner.

Average number of permits issued annually: 5

Fees: $250 application fee, plus a $250 classification fee. Class A dams are subject to an annual dam registration fee of $100 to support the State Dam Inspection Program.

Estimate processing time after application is deemed "complete": 4-5 weeks

Permit duration: 2 years to complete construction

Permit transferability: Current dam owner is required to notify DES if property is sold. Notification must include new owner's name and address.

Permit modification: Current dam owner is required to submit written request to DES describing any changes to the project as originally designed. With review of additional plans/specifications, DES may require that the permit be modified.

Permit renewal: If dam construction has not been completed within two years, the owner is required to submit a written request for a 2-year permit extension, which must be received prior to the expiration of the original permit or a new application will be required.

State statute: RSA 482 ("Dams, Mills, and Flowage", http://gencourt.state.nh.us/rsa/html/indexes/482.html)

N. H. Code of Administrative Rules: Env-Wr 100-800 ("Dam Safety Rules", http://www.des.state.nh.us/dam/env-wr100-800.html)

Appeals body: Water Council at RSA 21-O:7 ("Department of Environmental Services/Water Council", http://gencourt.state.nh.us/rsa/html/I/21-O/21-O-7.htm; see also http://www.des.state.nh.us/rules/env-wc200.pdf and http://www.des.state.nh.us/councils/#1)

Additional information: N. H. DES, Dam Bureau, (603) 271-3406
N. H. DES, Wetlands Bureau, (603) 271-2147
N. H. DES, Public Information Center, (603) 271-2975 or (603) 271-8876

Class A Dam Permit (Low Hazard Potential) – *Work Sheet*

Key Qualifier Question: *Will the proposed dam be constructed (or reconstructed) to qualify as a Class A dam which, if it were to fail, would result in any of the following: no possible loss of life, minimal economic loss, major damage to town and city roads, minor damage to Class I and Class II state highways, or the release of liquid industrial, agricultural, or commercial wastes or municipal sewage if the storage capacity is less than two acre-feet and is located more than 300 feet from a water body or water course?*

What must you do to apply?

- Obtain a copy of the *Application to Construct or Reconstruct a Dam* from the DES Dam Bureau, DES Public Information Center, or online at http://www.des.state.nh.us/dam/damapp.pdf.
- Review the DES Fact Sheets entitled *Basic Nomenclature of a Dam* http://www.des.state.nh.us/factsheets/dam/db-1.htm and *Dam Construction and Reconstruction – How to Proceed* at http://www.des.state.nh.us/factsheets/dam/db-3.htm.
- Provide the name, address, and telephone number of the applicant and define the height and length of the dam.
- Submit a copy of a U. S. Geological Survey map depicting the dam's location (see http://www.topozone.com). This location map should be drawn in sufficient detail to enable a DES inspector to locate the proposed construction site.
- Provide the municipal tax map number and lot number for the property upon which the dam will sit.
- Calculate the drainage area, pond area, and storage capacity of the dam.
- Define the type and describe the purpose of the dam.
- Describe and specify the type of foundation material to be used for the dam.
- Provide the design storm frequency and inflow, and the dam's discharge capacity.
- Prepare a brief description of downstream structures that could be impacted by the dam's failure.
- Identify the name of the stream, river, or water body to be affected.
- Submit a plan and cross section of the proposed dam.
- If this project is for reconstructing an existing dam, provide a description of the proposed reconstruction.
- Submit a written operational procedure plan and a construction inspection plan.
- Submit the results of subsurface explorations.
- Submit the results of hydrologic and hydraulic calculations.
- Demonstrate the dam has sufficient discharge capacity to pass the 100-year, 24-hour precipitation storm, or 0.3 of the probable maximum precipitation event ("PMP"), with one foot of freeboard without manual operations.
- Incorporate a pond drain.
- Submit a signed statement indicating that the applicant has flowage rights on all lands that will be temporarily or permanently flooded.
- Submit construction plans and specifications that comply with NH CODE ADMIN. RULES Env-Wr 100-800 (see http://www.des.state.nh.us/dam/env-wr100-800.html).
- Submit gradation specifications of embankment materials, plus results of a stability analysis for overturning, sliding, and slope failure (see http://www.des.state.nh.us/factsheets/dam/db-4.htm).
- Show 2.5:1 side slopes as a minimum on any earth portion of the dam (3:1 side slopes are preferred) with a minimum top width of 6 feet.
- A registered professional engineer licensed to practice in the state of New Hampshire must stamp the design plans (see http://www.state.nh.us/jtboard/pe.htm).
- Submit the application, a check for $250 made payable to the "Treasurer, State of New Hampshire", and all supporting materials to: Dam Bureau, Water Division, New Hampshire Department of Environmental Services, 6 Hazen Drive, P. O. Box 95, Concord, NH 03302-0095. Telephone: (603) 271-3406; fax: (603) 271-7894; or online: http://www.des.state.nh.us/dam/

- The site's hazard potential will be evaluated by DES Dam Bureau staff relative to such factors as the presence of downstream structures, roadways, and topography. The hazard class of a dam is based on the potential for adverse consequences to human life and property caused by a dam failure. The DES Dam Bureau will assess all impacts of dam failure when assigning a hazard classification (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Note: If the assessment confirms that the dam is a Class A structure, an additional payment of $250 will be required.

What types of projects require this permit?

- ❖ Low dams in semi-urban areas or low to medium dams on major water courses in large floodplain areas
- ❖ Dams greater than 6 feet high which impound more than 50 acre-feet of storage or dams which are greater than 25 feet high and impound more than 15 acre-feet of storage

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If there are questions regarding this page or any other section of the Guidebook, please contact Tim Drew, Administrator, Public Information and Permitting Unit, at tdrew@des.state.nh.us or at (603) 271-3306.

Class B Dam Permit (Significant Hazard Potential)

Introduction: There is a statewide need to conserve and control surface water flowage to accommodate multiple (and sometime conflicting) uses of our water resources, while still protecting public health and safety. Such uses include fire ponds, flood control, hydropower, irrigation and recreation. A "dam" is defined by RSA 482:2, II ("Dams, Mills, and Flowage/Definitions", http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm) as *any artificial barrier, including appurtenant works, which impounds or diverts water, and which has a height of 4 feet or more, or a storage capacity of 2 acre-feet or more, or is located at the outlet of a great pond. A roadway culvert shall not be considered a dam if its invert is at the natural bed of the water course, it has adequate discharge capacity, and it does not impound water under normal circumstances. Artificial barriers which create surface impoundments for liquid industrial or liquid commercial wastes or municipal sewage, regardless of height or storage capacity, shall be considered dams* (see http://www.des.state.nh.us/dam/damburweb.pdf. DES's Dam Bureau regulates the construction of new dams and the reconstruction of existing dams. For purposes of permitting, "reconstruction" is defined as changing the height, length, or discharge capacity of the structure; restoring a breached dam or one in ruins; modifying flashboards to either increase their height or increase the headwater elevation at which the boards will fail; or changing the structural configuration of a dam (see http://www.des.state.nh.us/factsheets/dam/db-3.htm). After receiving an application, a site visit will be conducted by a DES Dam Bureau engineer/inspector to assign a hazard classification and a State Dam Inventory number. DES will also provide notice of this determination to the municipality in which the dam is located. Pursuant to RSA 482:9, V ("Dams, Mills, and Flowage/Preliminary Filing of Information", http://gencourt.state.nh.us/rsa/html/L/482/482-9.htm), DES will not issue a permit for Class B or Class C dams unless the dam provides a public benefit of water supply; flood control; storage or treatment of industrial, agricultural, commercial or municipal wastes; hydropower; recreation; or preservation of historic or cultural resources; or unless the reconstruction is ordered by DES to correct a deficiency. Any previously unregistered dam must be registered with DES, including notice to the municipality, and must be classified in its proper hazard category (see http://www.des.state.nh.us/dam/exist_damapp.pdf). The State Legislature must first approve dams to be constructed on Great Ponds. In addition, if a dock, dam, building, or other structure is to be constructed in or adjacent to the bank or bed or any of the rivers that form New Hampshire's boundary (particularly the Connecticut River), the project applicant must also apply to the Commissioner of the New Hampshire Department of Transportation pursuant to RSA 1:8-10 ("State Boundaries", http://gencourt.state.nh.us/rsa/html/I/1/1-8.htm) for certification and a permit for the boundary work. Of New Hampshire's active dams, six percent are registered as "Class B" in the significant hazard category (see http://www.des.state.nh.us/factsheets/dam/db-14.htm). A Class B dam is one which, if it were to fail, would result in any of the following: possible loss of life, significant economic loss, major damage to Class I or II state highways, minor damage to interstate highways, loss of a municipal water supply reservoir which constitutes more than 50 percent of a community's source, or the release of liquid industrial, agricultural, or commercial wastes or municipal sewage if the storage capacity is at least two acre-feet and lies 300 feet or less from a water body or water course (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Due to the significant potential for property damage and loss of life, Class B dam owners are required by RSA 482:2, VI (see http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm) and 482:12 ("Dams, Mills, and Flowage/Inspecting Dams, Repairs, Emergency Action Plans", http://gencourt.state.nh.us/rsa/html/L/482/482-12.htm) to prepare an Emergency Action Plan (see http://www.des.state.nh.us/factsheets/dam/db-11.htm). Class B dams will be inspected every four years, with an eye toward structural deterioration or a change in development downstream. If a change in the potential for personal injury or property damage occurs, a Class B dam may be reclassified to reflect the change in hazard potential. Class B Dam Permits are recorded by the DES Dam Bureau at the county Registry of Deeds so as to run with the land and then are forwarded to the dam owner.

Average number of permits issued annually: 2

Fees: $250 application fee, plus a $750 classification fee. Class B dams are subject to an annual dam registration fee of $300 to support the State Dam Inspection Program.

Estimate processing time after application is deemed "complete": 6-8 weeks

Permit duration: 2 years to complete construction

Permit transferability: Current dam owner is required to notify DES if property is sold. Notification must include new owner's name and address.

Permit modification: Current dam owner is required to submit written request to DES describing any changes to the project as originally designed. With review of additional plans/specifications, DES may require that the permit be modified.

Permit renewal: If dam construction has not been completed within two years, the owner is required to submit a written request for a 2-year permit extension, which must be received prior to the expiration of the original permit or a new application will be required.

State statute: RSA 482 ("Dams, Mills, and Flowage", http://gencourt.state.nh.us/rsa/html/indexes/482.html)

N. H. Code of Administrative Rules: Env-Wr 100-800 ("Dam Safety Rules", http://www.des.state.nh.us/dam/env-wr100-800.html)

Appeals body: Water Council at RSA 21-O:7 ("Department of Environmental Services/Water Council", http://gencourt.state.nh.us/rsa/html/I/21-O/21-O-7.htm; see also http://www.des.state.nh.us/rules/env-wc200.pdf and http://www.des.state.nh.us/councils/#1)

Additional information: N. H. DES, Dam Bureau, (603) 271-3406
N. H. DES, Wetlands Bureau, (603) 271-2147
N. H. DES, Public Information Center, (603) 271-2975 or (603) 271-8876

Class B Dam Permit (Significant Hazard Potential) – *Work Sheet*

Key Qualifier Questions: *Will the dam be constructed (or reconstructed) to qualify as a Class B dam which, if it were to fail, would result in any of the following: possible loss of life, significant economic loss, major damage to Class I and II state highways, minor damage to interstate highways, loss of more than 50 percent of a municipal water supply, endangerment of public health, or the release of liquid industrial, agricultural, or commercial wastes or municipal sewage if the storage capacity is at least two acre-feet and is located 300 feet or less from a water body or water course? Will the dam provide a public benefit, or has reconstruction been ordered by DES to correct a deficiency?* (See RSA 482:9, V (a) and (b), respectively, "Dams, Mills, and Flowage/Preliminary Filing of Information", http://gencourt.state.nh.us/rsa/html/L/482/482-9.htm)

What must you do to apply?

- Obtain a copy of the *Application to Construct or Reconstruct a Dam* from the DES Dam Bureau, DES Public Information Center, or online at http://www.des.state.nh.us/dam/damapp.pdf.
- Review the DES Fact Sheets entitled *Basic Nomenclature of a Dam* http://www.des.state.nh.us/factsheets/dam/db-1.htm and *Dam Construction and Reconstruction – How to Proceed* at http://www.des.state.nh.us/factsheets/dam/db-3.htm.
- Provide the name, address, and telephone number of the applicant and define the height and length of the dam.
- Provide a copy of a U. S. Geological Survey map depicting the dam's location (see http://www.topozone.com). This location map should be drawn in sufficient detail to enable a DES inspector to locate the proposed construction site.
- Provide the municipal tax map number and lot number for the property upon which the dam will sit.
- Calculate the drainage area, pond area, and storage capacity of the dam.
- Define the type and describe the purpose of the dam.
- Describe and specify the type of foundation material to be used for the dam.
- Provide the design storm frequency and inflow, and the dam's discharge capacity.
- Prepare a brief description of downstream structures that could be impacted by the dam's failure.
- Identify the name of the stream, river, or water body to be affected.
- Submit a plan and cross section of the proposed dam.
- If this project is for reconstructing an existing dam, provide a description of the proposed reconstruction.
- Submit a written operational procedure plan and construction inspection plan.
- Submit the results of subsurface explorations.
- Submit the results of hydrologic and hydraulic calculations.
- Submit calculations that demonstrate the dam has sufficient discharge capacity to pass 0.5 of the probable maximum precipitation event ("PMP"), with one foot of freeboard without manual operations.
- Incorporate a pond drain.
- Submit a signed statement indicating that the dam owner has flowage rights on all land that will be temporarily or permanently flooded.
- Submit construction plans and specifications that comply with NH CODE ADMIN. RULES Env-Wr 100-800 (see http://www.des.state.nh.us/dam/env-wr100-800.html).
- Submit gradation specifications of embankment materials plus results of a stability analysis for overturning, sliding, and slope failure (see http://www.des.state.nh.us/factsheets/dam/db-4.htm).
- Show 2.5:1 side slopes as a minimum on any earth portion of the dam (3:1 side slopes are preferred) with a minimum top width of 6 feet.
- Draft an Emergency Action Plan with a breach analysis (see http://www.des.state.nh.us/factsheets/dam/db-11.htm).
- Employ a registered professional engineer licensed to practice in the state of New Hampshire for design and construction of dams (see http://www.state.nh.us/jtboard/pe.htm).

- Submit the application, a check for $250 made payable to the "Treasurer, State of New Hampshire", and all supporting materials to: Dam Bureau, Water Division, New Hampshire Department of Environmental Services, 6 Hazen Drive, P. O. Box 95, Concord, NH 03302-0095. Telephone: (603) 271-3406; fax: (603) 271-7894; or online: http://www.des.state.nh.us/dam/
- The site's hazard potential will be evaluated by DES Dam Bureau staff relative to such factors as the presence of downstream structures, roadways, and topography. The hazard class of a dam is based on the potential for adverse consequences to human life and property caused by a dam failure. The DES Dam Bureau will assess all impacts of dam failure when assigning a hazard classification (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Note: If the assessment confirms a Class B designation, an additional filing fee of $750 will be required.

What types of projects require this permit?

- ❖ Dams that impound drinking water supply reservoirs or wastewater treatment lagoons
- ❖ Dams that pose an appreciable threat to property and highways, and possible loss of life downstream

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If there are questions regarding this page or any other section of the Guidebook, please contact Tim Drew, Administrator, Public Information and Permitting Unit, at tdrew@des.state.nh.us or at (603) 271-3306.

Class C Dam Permit (High Hazard Potential)

Introduction: There is a statewide need to conserve and control surface water flowage to accommodate multiple (and sometime conflicting) uses of our water resources, while still protecting public health and safety. Such uses include fire ponds, flood control, hydropower, irrigation and recreation. A "dam" is defined by RSA 482:2, II ("Dams, Mills, and Flowage/Definitions", http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm) as *any artificial barrier, including appurtenant works, which impounds or diverts water, and which has a height of 4 feet or more, or a storage capacity of 2 acre-feet or more, or is located at the outlet of a great pond. A roadway culvert shall not be considered a dam if its invert is at the natural bed of the water course, it has adequate discharge capacity, and it does not impound water under normal circumstances. Artificial barriers which create surface impoundments for liquid industrial or liquid commercial wastes or municipal sewage, regardless of height or storage capacity, shall be considered dams* (see http://www.des.state.nh.us/dam/damburweb.pdf. DES's Dam Bureau regulates the construction of new dams and the reconstruction of existing dams. For purposes of permitting, "reconstruction" is defined as changing the height, length, or discharge capacity of the structure; restoring a breached dam or one in ruins; modifying flashboards to either increase their height or increase the headwater elevation at which the boards will fail; or changing the structural configuration of a dam (see http://www.des.state.nh.us/factsheets/dam/db-3.htm). After receipt of an application, a site visit will be conducted by a DES Dam Bureau engineer/inspector to assign a hazard classification and a State Dam Inventory number. DES also will provide notice of this determination to municipal officials in the host community. Pursuant to RSA 482:9, V ("Dams, Mills, and Flowage/Preliminary Filing of Information", http://gencourt.state.nh.us/rsa/html/L/482/482-9.htm), DES will not issue a permit for Class B or Class C dams unless the dam provides a public benefit of water supply; flood control; storage or treatment of industrial, agricultural, commercial or municipal wastes; hydropower; recreation; or preservation of historic or cultural resources; or unless the reconstruction is ordered by DES to correct a deficiency. Any previously unregistered dam must be registered with DES, including notice to the municipality, and must be classified in its proper hazard category (see http://www.des.state.nh.us/dam/exist_damapp.pdf). The State Legislature must first approve dams to be constructed on Great Ponds. In addition, if a dock, dam, building, or other structure is to be constructed in or adjacent to the bank or bed or any of the rivers that form New Hampshire's boundary (particularly the Connecticut River), the project applicant must also apply to the Commissioner of the New Hampshire Department of Transportation pursuant to RSA 1:8-10 ("State Boundaries", http://gencourt.state.nh.us/rsa/html/I/1/1-8.htm) for certification and a permit for the boundary work. Of New Hampshire's active dams, three percent are registered as "Class C" in the high hazard category (see http://www.des.state.nh.us/factsheets/dam/db-14.htm). A Class C dam is one that, if it were to fail, would result in the probable loss of life or major damage inflicted to interstate highways (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Due to the high potential for loss of life or major damage to interstate highways, owners of Class C dams are required by RSA 482:2, VI ("Dams, Mills, and Flowage/Definitions", http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm) and RSA 482:12 ("Dams, Mills, and Flowage/Inspecting Dams, Repairs, Emergency Action Plans", http://gencourt.state.nh.us/rsa/html/L/482/482-12.htm) to prepare an Emergency Action Plan (see http://www.des.state.nh.us/factsheets/dam/db-11.htm). Class C dams will be inspected every two years, with an eye toward structural deterioration and a change in downstream development. If the potential for personal injury or property damage has decreased, a Class C dam may be reclassified to reflect the change in hazard potential. Class C Dam Permits are recorded by the DES Dam Bureau at the appropriate county Registry of Deeds so as to run with the land and then are forwarded to the dam owner.

Average number of permits issued annually: 1

Fees: $250 application fee, plus a $1,000 classification fee. Class C dams are subject to an annual dam registration fee of $600 to support the State Dam Inspection Program.

Estimate processing time after application is deemed "complete": 10-12 weeks

Permit duration: 2 years to complete construction

Permit transferability: Current dam owner is required to notify DES if property is sold. Notification must include new owner's name and address.

Permit modification: Current dam owner is required to submit written request to DES describing any changes to the project as originally designed. With review of additional plans/specifications, DES may require that the permit be modified.

Permit renewal: If dam construction has not been completed within two years, the owner is required to submit a written request for a 2-year permit extension, which must be received prior to the expiration of the original permit or a new application will be required.

State statute: RSA 482 ("Dams, Mills, and Flowage", http://gencourt.state.nh.us/rsa/html/indexes/482.html)

N. H. Code of Administrative Rules: Env-Wr 100-800 ("Dam Safety Rules", http://www.des.state.nh.us/dam/env-wr100-800.html)

Appeals body: Water Council at RSA 21-O:7 ("Department of Environmental Services/Water Council", http://gencourt.state.nh.us/rsa/html/I/21-O/21-O-7.htm; see also http://www.des.state.nh.us/rules/env-wc200.pdf and http://www.des.state.nh.us/councils/#1)

Additional information: N. H. DES, Dam Bureau, (603) 271-3406
N. H. DES, Wetlands Bureau, (603) 271-2147
N. H. DES, Public Information Center, (603) 271-2975 or (603) 271-8876

Class C Dam Permit (High Hazard Potential) – *Work Sheet*

Key Qualifier Questions: *Will the proposed dam be constructed (or reconstructed) to qualify as a Class C dam which, if it were to fail, would result in probable loss of life or major damage to interstate highways? Will the dam provide a public benefit, or has reconstruction been ordered by DES to correct a deficiency?* (See RSA 482:9, V (a) and (b), respectively, "Dams, Mills, and Flowage/Preliminary Filing of Information", http://gencourt.state.nh.us/rsa/html/L/482/482-9.htm)

What must you do to apply?

- Obtain a copy of the *Application to Construct or Reconstruct a Dam* from the DES Dam Bureau, DES Public Information Center, or online at http://www.des.state.nh.us/dam/damapp.pdf.
- Review the DES Fact Sheets entitled *Basic Nomenclature of a Dam* http://www.des.state.nh.us/factsheets/dam/db-1.htm and *Dam Construction and Reconstruction – How to Proceed* at http://www.des.state.nh.us/factsheets/dam/db-3.htm.
- Provide the name, address, and telephone number of the applicant and define the height and length of the dam.
- Submit a copy of a U. S. Geological Survey map depicting the dam's location (see http://www.topozone.com). This location map should be drawn in sufficient detail to enable a DES inspector to locate the proposed construction site.
- Provide the municipal tax map number and lot number for the property upon which the dam will sit.
- Calculate the drainage area, pond area, and storage capacity of the dam.
- Define the type and describe the purpose of the dam.
- Describe and specify the type of foundation material to be used for the dam.
- Provide the design storm frequency and inflow, and the dam's discharge capacity.
- Prepare a brief description of downstream structures that could be impacted by the dam's failure.
- Identify the name of the stream, river, or water body to be affected.
- Submit a plan and cross section of the proposed dam.
- If this project is for reconstructing an existing dam, provide a description of the proposed reconstruction.
- Submit a written operational procedure plan and construction inspection plan.
- Submit the results of subsurface explorations.
- Submit the results of hydrologic and hydraulic calculations.
- Submit calculations that demonstrate the dam has sufficient discharge capacity to pass the probable maximum precipitation ("PMP") event, with one foot of freeboard without manual operations.
- Incorporate a pond drain.
- Submit a signed statement indicating that the dam owner has flowage rights on all land that will be temporarily or permanently flooded.
- Submit construction plans and specifications that comply with NH CODE ADMIN. RULES Env-Wr 100-800 (See http://www.des.state.nh.us/dam/env-wr100-800.html).
- Submit gradation specifications of embankment materials plus results of a stability analysis for overturning, sliding, and slope failure (see http://www.des.state.nh.us/factsheets/dam/db-4.htm).
- Show 2.5:1 side slopes as a minimum on any earth portion of the dam (3:1 side slopes are preferred) with a minimum top width of 6 feet.
- Draft an Emergency Action Plan with a breach analysis (see http://www.des.state.nh.us/factsheets/dam/db-11.htm).
- Employ a registered professional engineer licensed to practice in the state of New Hampshire in dam design and construction standards and practices to ensure compliance with approved plans and specifications (see http://www.state.nh.us/jtboard/pe.htm).
- Submit the application, a check or money order for $250 made payable to the "Treasurer, State of New Hampshire", and all supporting materials to: Dam Bureau, Water Division, New Hampshire Department

of Environmental Services, 6 Hazen Drive, P. O. Box 95, Concord, NH 03302-0095. Telephone: (603) 271-3406; fax: (603) 271-7894; or online: http://www.des.state.nh.us/dam/

- The site's hazard potential will be evaluated by DES Dam Bureau staff relative to such factors as the presence of structures, roadways, and topography. The hazard class of a dam is based on the potential for adverse consequences to human life and property caused by a dam failure. The DES Dam Bureau will assess all impacts of dam failure when assigning a hazard classification (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Note: If the assessment confirms a Class C designation, an additional filing fee of $1,000 will be required.

What types of projects require this permit?

- ❖ Medium to high dams located upstream from developed areas (downstream subdivisions, roads, and utilities)
- ❖ Dams that pose an extensive threat to property and highways and probable loss of life downstream

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If there are questions regarding this page or any other section of the Guidebook, please contact Tim Drew, Administrator, Public Information and Permitting Unit, at tdrew@des.state.nh.us or at (603) 271-3306.

Hydropower Dam Permit (All Hazard Classifications)

Introduction: There is a statewide need to conserve and control surface water flowage to accommodate multiple, and sometime conflicting, uses of our water resources, while still protecting public health and safety. Such uses include fire ponds, flood control, hydropower, irrigation and recreation. A "dam" is defined by RSA 482:2, II ("Dams, Mills, and Flowage/Definitions", http://gencourt.state.nh.us/rsa/html/L/482/482-2.htm) as *any artificial barrier, including appurtenant works, which impounds or diverts water, and which has a height of 4 feet or more, or a storage capacity of 2 acre-feet or more, or is located at the outlet of a great pond. A roadway culvert shall not be considered a dam if its invert is at the natural bed of the water course, it has adequate discharge capacity, and it does not impound water under normal circumstances. Artificial barriers which create surface impoundments for liquid industrial or liquid commercial wastes or municipal sewage, regardless of height or storage capacity, shall be considered dams* (see http://www.des.state.nh.us/dam/damburweb.pdf). DES's Dam Bureau regulates the construction and reconstruction of hydropower dams, which may encompass any hazard category (AA, A, B, or C) (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). At the time of application, each proposed dam will be classified by a DES Dam Bureau engineer/inspector in accordance with NH CODE ADMIN. RULES Env-Wr 100-800 (see http://www.des.state.nh.us/dam/env-wr100-800.html) and then provided with a State Dam Inventory registration number, with notice provided by DES to municipal officials in the host community. Any dams to be constructed on Great Ponds must first be approved by the State Legislature. In addition, if a dock, dam, building, or other structure is to be constructed in or adjacent to the bank or bed of any of the rivers that form New Hampshire's boundary (particularly the Connecticut River), the project applicant must also apply to the Commissioner of the New Hampshire Department of Transportation pursuant to RSA 1:8-10 ("State Boundaries", http://gencourt.state.nh.us/rsa/html/I/1/1-8.htm) for certification and a permit for the boundary work. Hydropower or milldams are structures that capture the flowing water's energy and convert it to electrical or mechanical power for use at manufacturing operations, electric power generation facilities, or for the operation of unit processes at mills or public utilities. Developers of hydroelectric facilities must demonstrate that the construction and operation of such dams will result in measurable public benefits such as recreation, flood control, or wildlife habitat, since their presence may impact the public's "reasonable use" of surface water for private gains pursuant to RSA 482:9, V (a) and (b), respectively ("Dams, Mills, and Flowage/Preliminary Filing of Information", http://gencourt.state.nh.us/rsa/html/L/482/482-9.htm). If the proposed hydroelectric dam falls within the jurisdiction of the Federal Energy Regulatory Commission ("FERC"), the owner must also secure a federal order granting a license to operate the facility in the public's interest (see http://www.ferc.gov/documents/forms/forms.htm#HYDROPOWER). The DES Dam Bureau works in close cooperation with the FERC on proposals that incorporate issues on navigation, recreation, and commerce.

Average number of permits issued annually: Few, varies from year-to-year

Fees: $250 application fee, plus a fee corresponding to the assigned hazard classification. An additional $100 initial deposit must be submitted with the application to cover costs associated with a public hearing. Additional monies may be required depending on the final cost of the process. An annual dam registration fee, to support the State Dam Inspection Program, may be required depending upon the resulting hazard classification.

Estimate processing time after application is deemed "complete": 6-12 months for DES Dam Permit, and up to three years for a new FERC license

Permit duration: Two years for facility construction, or as provided by the FERC license

Permit transferability: Current dam owner is required to notify DES if property is sold. Notification must include new owner's name and address, and respond to pertinent FERC requirements.

Permit modification: Current dam owner is required to submit a written request to DES describing any changes to project as originally designed. Upon review of additional plans and specifications, DES may

require that the permit be modified. Owner must also address FERC requirements for modifying the facility in accordance with its regulations.

Permit renewal: If dam construction has not been completed within two years, the owner is required to submit a written request for a two-year permit extension and be consistent with the FERC requirements when the facility lies within its jurisdiction. This request must be received prior to the original permit's expiration, or a new application will be required.

State statute: RSA 482 ("Dams, Mills, and Flowage", http://gencourt.state.nh.us/rsa/html/indexes/482.html)
Federal law: 16 U.S.C. § 791a *et seq.* ("Federal Power Act", http://www.ferc.gov/informational/acts/fpa.htm)

N. H. Code of Administrative Rules: Env-Wr 100-800 ("Dam Safety Rules", http://www.des.state.nh.us/dam/env-wr100-800.html)
Code of Federal Regulations: CFR Title 18, PARTS 1-399 ("Conservation of Power", http://www.ferc.gov/legal/stats&regs/statsandregs.htm)

Appeals body: Water Council at RSA 21-O:7 ("Department of Environmental Services/Water Council", http://gencourt.state.nh.us/rsa/html/I/21-O/21-O-7.htm; see also http://www.des.state.nh.us/rules/env-wc200.pdf, http://www.des.state.nh.us/councils/#1); and/or FERC hydropower requirements, (http://www.ferc.fed.us/hydro/hydro2.htm)

Additional Information;
N. H. DES, Dam Bureau, (603) 271-3406
N. H. DES, Rivers Management and Protection Program, (603) 271-8865
N. H. DES, Public Information Center, (603) 271-2975 or (603) 271-8876
U. S. DOE, Federal Energy Regulatory Commission, (212) 273-5900

Hydropower Dam Permit (All Hazard Classifications) – *Work Sheet*

Key Qualifier Questions: *Does the project involve the construction of a dam for the primary purpose of capturing energy for conversion to mechanical or electrical power for use at manufacturing facilities, for the generation of renewable electrical power, or for the operation of mills or public utilities? If the dam's hazard classification is likely to be Class B or Class C, will the dam provide a public benefit, or has reconstruction been ordered by DES to correct a deficiency?* (See RSA 482:9, V (a) and (b), respectively, "Dams, Mills, and Flowage/Preliminary Filing of Information", http://gencourt.state.nh.us/rsa/html/L/482/482-9.htm)

What must you do to apply?

- Obtain a copy of the *Application to Construct or Reconstruct a Dam for Hydropower* from the DES Dam Bureau, DES Public Information Center, or online at http://www.des.state.nh.us/dam/damapp.pdf.
- Review the DES Fact Sheets entitled *Basic Nomenclature of a Dam* http://www.des.state.nh.us/factsheets/dam/db-1.htm and *Dam Construction and Reconstruction – How to Proceed* at http://www.des.state.nh.us/factsheets/dam/db-3.htm.
- Provide the name, address, and telephone number of the applicant and define the height and length of the dam.
- Submit a copy of a U. S. Geological Survey map depicting the dam's location (see http://www.topozone.com). This location map should be drawn in sufficient detail to enable a DES inspector to locate the proposed construction site.
- Provide the municipal tax map number and lot number for the property upon which the dam will sit.
- Calculate the drainage area, pond area, and storage capacity of the dam and define its type and purpose.
- Describe and specify the type of foundation material to be used for the dam.
- Provide the design storm frequency and inflow, and the dam's discharge capacity.
- Prepare a brief description of downstream structures that could be impacted by the dam's failure.
- Identify the name of the stream, river, or water body to be affected.
- Submit a plan and cross section of the proposed dam.
- Incorporate a pond drain.
- If this project is for reconstructing an existing dam, provide a description of the proposed reconstruction.
- Submit a written operational procedure plan and construction inspection plan.
- Submit the results of subsurface explorations.
- Submit the results of hydrologic and hydraulic calculations.
- Submit calculations that demonstrate the dam has sufficient discharge capacity to pass the appropriate design storm without manual operations.
- Submit construction plans and specifications that comply with NH CODE ADMIN. RULES Env-Wr 100-800 (see http://www.des.state.nh.us/dam/env-wr100-800.html).
- Submit gradation specifications of embankment materials and, if the dam is classified as either A, B, or C, submit the results of a stability analysis for overturning, sliding, and slope failure (see http://www.des.state.nh.us/factsheets/dam/db-4.htm).
- Show 2.5:1 side slopes as a minimum on any earth portion of the dam (3:1 side slopes are preferred) with a minimum top width of 6 feet.
- Submit a signed statement indicating that the dam owner has flowage rights on all land that will be temporarily or permanently flooded.
- Draft an Emergency Action Plan with a breach analysis (see http://www.des.state.nh.us/factsheets/dam/db-11.htm), if the dam's hazard classification is Class B or Class C.
- Employ a registered professional engineer licensed to practice in the state of New Hampshire for design and construction (see http://www.state.nh.us/jtboard/pe.htm), if the dam's hazard classification is Class A, Class B, or Class C.

- Submit the application, a check for $350 made payable to the "Treasurer, State of New Hampshire", with all supporting materials to: Dam Bureau, Water Division, New Hampshire Department of Environmental Services, 6 Hazen Drive, P. O. Box 95, Concord, NH 03302-0095. Telephone: (603) 271-3406; fax: (603) 271-7894; or online: http://www.des.state.nh.us/dam/ (See also http://www.ferc.fed.us/hydro/hydro2.htm)
- The site's hazard potential will be evaluated by DES Dam Bureau staff relative to such factors as the presence of structures, roadways, and topography. The hazard class of a dam is based on the potential for adverse consequences to human life and property caused by a dam failure (see http://www.des.state.nh.us/factsheets/dam/db-10.htm). The DES Dam Bureau will assess all impacts of dam failure when assigning hazard classifications (see http://www.des.state.nh.us/factsheets/dam/db-15.htm). Note: Depending on the classification of the structure, an additional filing fee may be necessary.

What types of projects require this permit?

- ❖ A project proposed to generate mechanical power for operating a textile mill
- ❖ A small-scale hydroelectric project for local distribution
- ❖ A large public utility project to generate electrical power on a major New Hampshire river

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If there are questions regarding this page or any other section of the Guidebook, please contact Tim Drew, Administrator, Public Information and Permitting Unit, at tdrew@des.state.nh.us or at (603) 271-3306.